Author's response to reviews

Title: Socio-economic status, racial composition and the affordability of fresh fruits and vegetables in neighborhoods of a large rural region in Texas

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Author's response to reviews: see over
Response to Reviewers and Editor

We thank the reviewers for taking their time to review our manuscript and providing insightful comments and suggestions for improving our article. We will address the comments by reviewer.

Reviewer: Diana Smith

Major Compulsory Revisions

1. In the abstract the authors state that the study includes six rural and one urban county. The next sentence reads ‘Ground-truthed data from the Brazos Valley Food Environment Project were used to identify all food stores (6 rural, 1 urban), and the availability and lowest price of fresh whole fruit and vegetables in the food stores.’ It is unclear what the numbers in parentheses following the food stores indicate? The introduction then uses language such as ‘six predominantly rural counties’. What proportion of the CBGs, if any, fell within the urban county? If the urban county was not included, then better to adjust the abstract to reflect that rather than stating twice in the abstract that an urban county was included.

RESPONSE: We thank the reviewer for pointing out the inconsistency in our abstract. Several sentences from a previous version slipped through during proofing. The abstract has been corrected to more clearly state that only the six rural counties of the Brazos Valley are considered. Since all six of the study counties were rural, we deleted the word “predominately”. All 101 CBGs were in the six rural counties.

2. Some of the grammar is slightly unusual. For example, in the first paragraph in the Introduction, I think it would read better as ‘...differences (plural) in eating behavior originate from differences in access to healthy food options. The following paragraph: ‘Studies that do consider rural populations have focused (on) differences in affordability across store types, rather than across the characteristics of residents. Then on page 2: ‘While some find a positive relationship between socio-economic status (24, 25), other(s) have reported that there is no statistically significant differences (23, 27). ‘Moreover, this rural region in central Texas is home to a socioeconomically and demographically (rather than demographic) diverse population.’ Please read carefully through the paper for grammar.

RESPONSE: The suggestions of the reviewer have been incorporated to improve the flow of the paper and are highlighted in the revised version.
3. Table 2: The summary statistics for store types do not make sense intuitively. Perhaps the +/- values of the ‘mean’ (which I believe is actually the total for the sample of store) is not meant to be included? Equally the minimum and maximum values for store categories. The table also makes it look like there were only 23 CBGs included in the analysis (down from the 101 mentioned on page 3); however there is an earlier comment that some CBGs had more than one store. Are there only 23 CBGs in the final sample of stores that had sufficient stock for price comparison?

This leads to a question about the sub-sample of CBGs compared to the full sample of 101. The county-level stats on page 3 could be revised to reflect the entire sample of CBGs, to allow for a more direct socioeconomic/demographic comparison to the CBGs profiled in table 2. Reading further down to the last paragraph on page 8 this seems to be the case, but it is not explicit.

RESPONSE: The means reported in Table 2 are conditional means, i.e. calculated only over the set of store with non-missing prices. We added a footnote to explain that the reported means are conditional means. We believe this should reduce any potential confusion arising in Table 2. Means were store characteristics were revised to indicate %; the min and max for the % were removed from the table.

The reviewer is correct. Of the 101 CBG’s in the six counties, 23 contained a store with sufficient price information to be included in the analysis. Of the 78 CBGs not represented, the overwhelming reason is the lack of a store or only a convenience store that did not sell fresh fruit and vegetable items. This has been made explicit. The summary statistics for all 101 CBG are reported in the first paragraph of the Methods section. The ability to compare the included CBGs using the stats from Table 2 with the entire region using the stats in the Methods section has been made explicit.

4. In the limitations, there is no mention of the possible impact of seasonal variation on food prices. Given that the study spanned 10 months it is likely that prices (and availability of certain fresh fruit/veg items) will be impacted by the growing and harvest season.

RESPONSE: This has been noted in the discussion section.

Minor Essential Revisions

1. Regarding the types of fresh fruit & veg included in the survey, the authors mention that these were chosen with input from local residents and nutrition
professionals; a sentence to explain how they were chosen (focus groups, interviews) or pointer to another publication if it was covered there.

RESPONSE: We include mention of “interviews” and provide a reference for the original work.

2. This line of the abstract could be rewritten to be clearer, as I understand the meaning but it is slightly ambiguous: ‘The cost of fresh produce in both urban and rural areas is increasing in the proportion of Black residents in the surrounding community, but only increasing in the proportion of Hispanic residents in urban areas.’

RESPONSE: This correction has been made to the abstract.

3. Page 3: please provide a reference for the county-level population characteristics (first paragraph). Similarly, for Fresh Look Marketing data on page 4.

RESPONSE: References have been provided.

4. Page 9: Ceteris paribus is not commonly used, maybe better to use to English version of all other things being equal.

RESPONSE: Ceteris paribus has been replaced with all else equal.
Reviewer: Angela Liese

Minor Essential Revisions

1. Page 3, third paragraph: Reference is made here to the process of locating and geocoding all stores that could sell food items. If the authors in fact geocoded the stores (which implies obtaining a full street address, using a geographic information system software to generate geo-coordinates etc), then it would be very helpful if the software and road file used would be mentioned briefly, as well as the address match rate. If, however, a GPS device was used to obtain the geo-coordinates while the trained observers were on the store grounds, then the term “geocoding” should not be used, but the process and device described.

RESPONSE: This has been revised to provide greater detail.

2. It would also be helpful if somewhere in the methods section the authors would state that each store was assigned to its Census block group and what method was used to accomplish this.

RESPONSE: This has been added to the methods section.

3. Page 9 description of results shown in Table 3: My strong recommendation would be to present the results of the univariate regression first, followed by the multivariate results. This approach would seem more consistent with the way data analyses are typically conducted, moving from the surface (crude, potentially biased approaches) to the more sophisticated in-depth models. Again, this is my recommendation, but I could be convinced otherwise if there are specific reasons.

RESPONSE: We agree with the reviewer. This has been corrected

4. Page 11-12: The authors very thoughtfully interpret their findings on the relation of neighborhood income and food prices, offering several different plausible reasons. However, with respect to the reason why food prices would be higher in stores in areas with a larger African American population is not discussed beyond potential consequences. Can the authors speculate on why prices in African American neighborhoods would be higher than White neighborhoods (controlling for income levels) but not in Hispanic neighborhoods compared to White neighborhoods?

RESPONSE: Sentence added to discussion.

Discretionary Revisions

5. Page 4, second paragraph, first and second sentence: I had to reread this section multiple times because I initially could not reconcile the numbers
presented here (9 fruits, 10 vegetables) with those presented in the paragraph above. It might be clearer to word these sentences like this: “...., 9 of the 10 fruits used accounted for ...” and “Ten of the 11 vegetables used account for ...”

RESPONSE: Although mango and okra are on the survey sheets, they were omitted from the analysis because their availability was limited and they account for a very small consumption share. Change made as suggested.

6. Page 9, second paragraph: “Multivariate regression analysis..... revealed that stores in CBG with higher median household incomes and greater proportion of Black residents tended to....” This may be a matter of semantics, but my initial read of this sentence and similar ones later on that link the two key attributes (income & race) was that stores in areas that had both higher incomes and a higher proportion of Black residents were meant. Clearly, that is not what the authors intended to convey, as these results are from a multivariate regression model that contains both variables, but not in terms of an interaction. If it were possible to make this point clearer, I think it would avoid confusion by other readers.

RESPONSE: We thank the reviewer for pointing out this potential source of confusion. We have addressed this in the revision to make the distinction clearer.
Editor Revisions:

1. Please restructure the Abstract. The abstract should be composed of the following four sections: Background, Method, Results and Conclusion and should be no longer than 350 words.

   RESPONSE: Abstract rewritten as suggested.

2. Please include a Conclusions section as the last section of the text. This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

   RESPONSE: Conclusion section added.

3. Please remove the key words/word count/running title/line numbering section as this section is not needed for publication.

   RESPONSE: We have complied with the request.